REMARKS

The Final Office Action dated June 6, 2005 has been carefully considered. Claims 1, 2 and 4 are in this application.

The previously presented claims were rejected under 35 U.S.C. § 103 as obvious in view of U.S. Patent No. 3,904,652 to Frank in combination with U.S. Patent No. 3,366,648 to Kerr. Applicants respectfully submit that the teachings of these references do not teach or suggest the invention defined by the present claims.

Applicants submit that in accordance with the teachings of both Frank and Kerr, the oxygen concentration starts from, e.g., 18% (dot pattern portion) to the portion out of the dot pattern portion lowering the concentration as shown in Fig. 4 of the present application. Then the concentration of the raw material is increased within the non-dot pattern portion, and the mixture thereof is subjected to the reaction. Accordingly, Frank and Kerr teach the explosion range of an ordinary reactor, as shown in Fig. 4 and described on page 3, line 15 to page 4, line 19 of the present application as follows:

> Since the explosion range inherent in the reactor for the catalytic gas phase oxidation varies with the temperature, the pressure, and the kind of the inert gas to be used, it is necessary to find the explosion range by a preliminary actual measurement and then proceed to control the reaction so as to avoid the explosion range consequently found. The explosion range of the ordinary reactor for the catalytic gas phase oxidation will be described below with the aid of Fig. 4. In Fig. 4, the horizontal axis is the scale for the concentration of oxygen and the vertical axis the scale for the concentration of a raw material to be oxidized and the hatched part is the explosion range which is formed by mixing oxygen and the raw material. The lowermost concentration of the raw material in the gas composition forming the explosion range is called "the concentration of the lower explosion limit of the raw material to be oxidized" and the lowermost concentration of oxygen in the gas composition forming the explosion range is called "the limiting oxygen concentration", in the specification. With reference to Fig. 4, the point of intersection of these two concentrations in the reactor for the catalytic gas phase oxidation is indicated by the mark ③. When the composition of the feed gas in the steady state is indicated by the mark ① indicating the concentration of the raw material gas to be 4.5 vol. % and the concentration of oxygen to be 10 vol. %, for example, it is safe for the purpose of using the reactor while avoiding the explosion range and easy for the adjustment of the

> composition of the raw material as well to supply to the reactor a feed gas of the composition through the mark ② in which the concentration of the raw material gas is 0 vol. % and the concentration of oxygen is less than the limiting oxygen concentration. It has been heretofore customary, therefore, to adopt the route in which the concentration of oxygen passes the point ② which falls short of the limiting oxygen concentration regarding oxygen concentration and alter the composition on one straight line of the target composition marked as ①.

In contrast, in the present invention the oxygen concentration starts from 18% (dot pattern portion) to the non-dot pattern portion through cross pattern portion as shown in Fig. 1 of the present application. Then the mixture thereof is subjected to the reaction.

The Examiner stated that Frank teaches to decrease the oxygen concentration in order to avoid the explosion range and has pointed out that a skilled artisan can easily arrange the oxygen concentration under the explosion lower limit range which is had by the raw material. To the contrary, according to the invention defined by the present claims, during starting up of the reactor the concentration of the raw material of less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is not less than the limiting oxygen concentration. Accordingly, it is necessary that the oxygen concentration should pass above the explosion limit of the oxygen. Thus, the present invention is quite different from Frank and, in fact, Frank teaches away from the present invention by teaching that the oxygen concentration is decreased below the explosion limit of the oxygen to avoid the explosion range.

The Examiner also states that Kerr teaches the concentration of the raw material (monoolefin) is 1.0-1.5 mol%, and although the raw material gas is different, it can be combined with Frank by a skilled artisan to provide concentration of oxygen less than the limiting oxygen concentration. However, the feature of the concentration of oxygen in accordance with the present invention resides in passing a range during starting up of the reactor in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is not less than the limiting oxygen concentration (excluding 0% of concentration of oxygen). However, neither Frank nor Kerr teach this feature. Rather, Frank's disclosure corresponds to prior

art shown in Fig. 4 of the present application. Therefore, even if Frank is combined with Kerr, it suggests only a method for controlling the concentration of oxygen and raw material gas, as shown in Fig. 4. However, Kerr does not suggest to increase the concentration of the raw material gas until the steady state, or have a concentration of oxygen not less than the limiting oxygen concentration and does not cure the deficiencies of Frank.

Accordingly, the construction of the present invention is not taught or suggested by Frank or Kerr, even if Frank, which discloses that the concentration of the oxygen is under the explosion range, is combined with Kerr, which discloses that the concentration of the raw material (monoolefin) is controlled to 1.0-1.5 mol%. Since neither reference teaches a method for starting up by passing "the range in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material" and "the concentration of oxygen is not less than the limiting oxygen concentration."

According to the unique construction in accordance with the present invention, it has the following unexpected results:

(1) Decrease of a large amount of a diluting gas for controlling the oxygen concentration.

(2) Quick starting up is possible, and each flow amounts are little, even when the exhausted gas is recycled to the reactor.

As described on page 6, lines 20-29, "it is made possible to decrease the amount of a diluting gas supplied to the reactor and, even when the discharged gas remaining after the absorption of the target compound contained in the formed gas emanating from the reactor is recycled to the reactor, repress the variations of the relevant flow rates, permit prompt startup of the reactor, consequently decrease the number of operation steps and the amount of the diluting gas, and accomplish safe startup of the reactor while enabling the reaction to avoid the explosion range." There are no hints or suggestions in Frank or Kerr for such advantages of a method for starting up a reactor.

In addition, both references do not disclose or suggest how to start up a reactor, especially by causing a raw material to be oxidized and a molecular oxygen-containing

gas to pass a range in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is not less than the limiting oxygen concentration, but excluding the concentration of said raw material of 0 vol. %, and ii) then for reaching steady state causing a range in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is less than the limiting oxygen concentration, thereby reaching the steady state.

Accordingly, the invention defined by the present claims is not obvious in view of Frank in combination with Kerr.

The application is now believed to be in a condition for allowance and an early notification thereof is respectfully requested. The Examiner is invited to contact the undersigned should he believe this would expedite prosecution of this application. It is believed no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

Dated: November 16, 2005

Diane Dunn McKay, Esq.
Reg. No. 34,586
Attorney for Applicant

MATHEWS, SHEPHERD, McKAY & BRUNEAU, P.A.
100 Thanet Circle, Suite 306
Princeton, NJ 08540
Tel: 609 924 8555
Fax: 609 924 3036